

# PHOTOGRAPHY DEPARTMENT TECHNICAL GUIDE

Columbia University School of the Arts  
Photography Department v1.0  
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# 35MM SLR CAMERA BASICS

- Parts of a 35mm Single Lens Reflex (SLR) Camera
- Loading 35mm Film
- Rewinding and Unloading 35mm Film
- Properly Holding the Camera

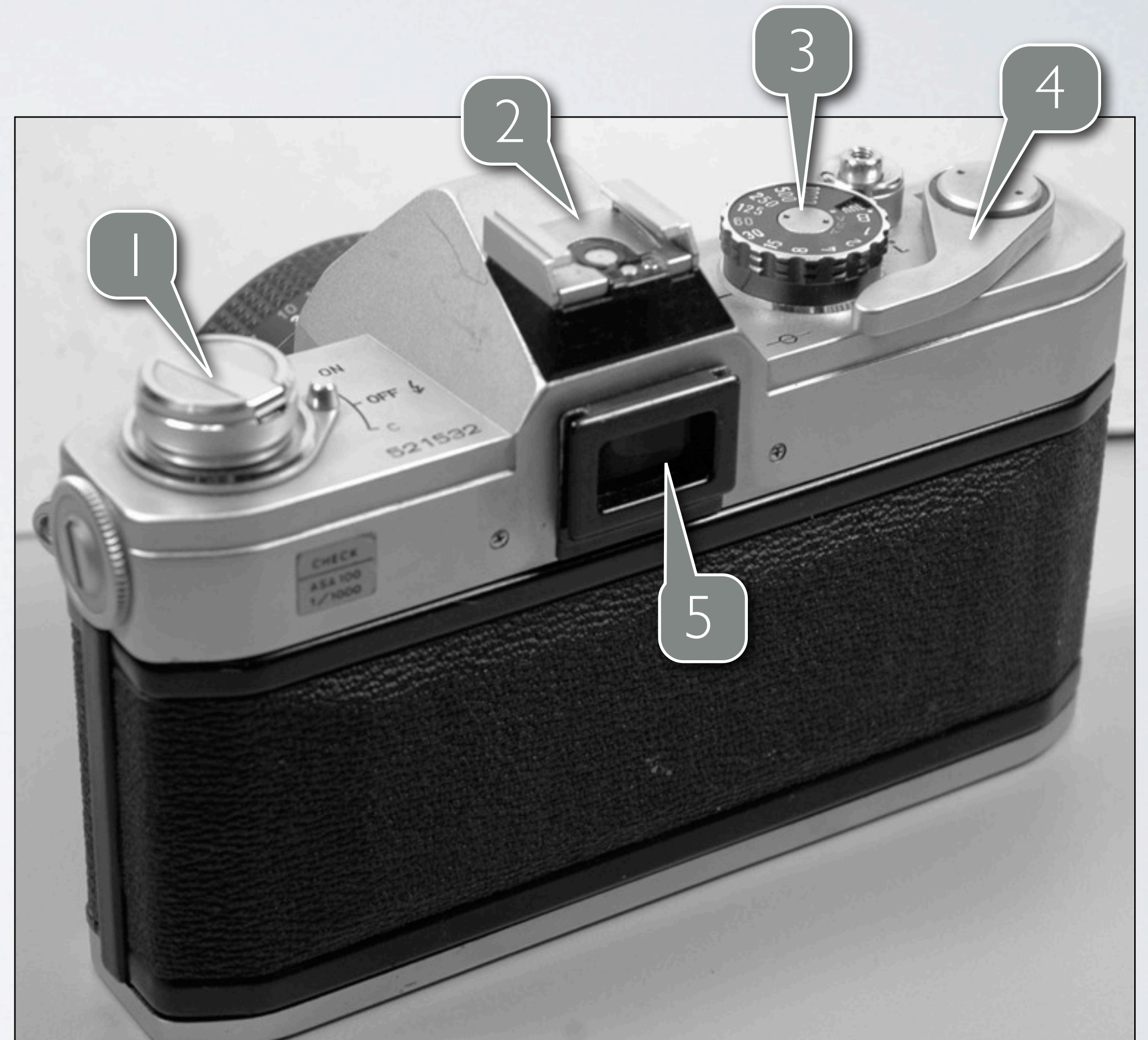
# 35MM SLR CAMERA FRONT

1. Film Advance Lever
2. Shutter Speed Selector
3. Film Rewind Crank
4. Shutter Release
5. Self-Timer (optional)
6. Focusing Ring
7. Aperture Ring



# 35MM SLR CAMERA BACK

1. Film Rewind Crank
2. Accessory / Hot Shoe
3. Shutter Speed Selector
4. Film Advance Lever
5. Viewfinder Eyepiece



# 35MM SLR CAMERA BOTTOM

1. Viewfinder Eyepiece

2. Battery Compartment Cover

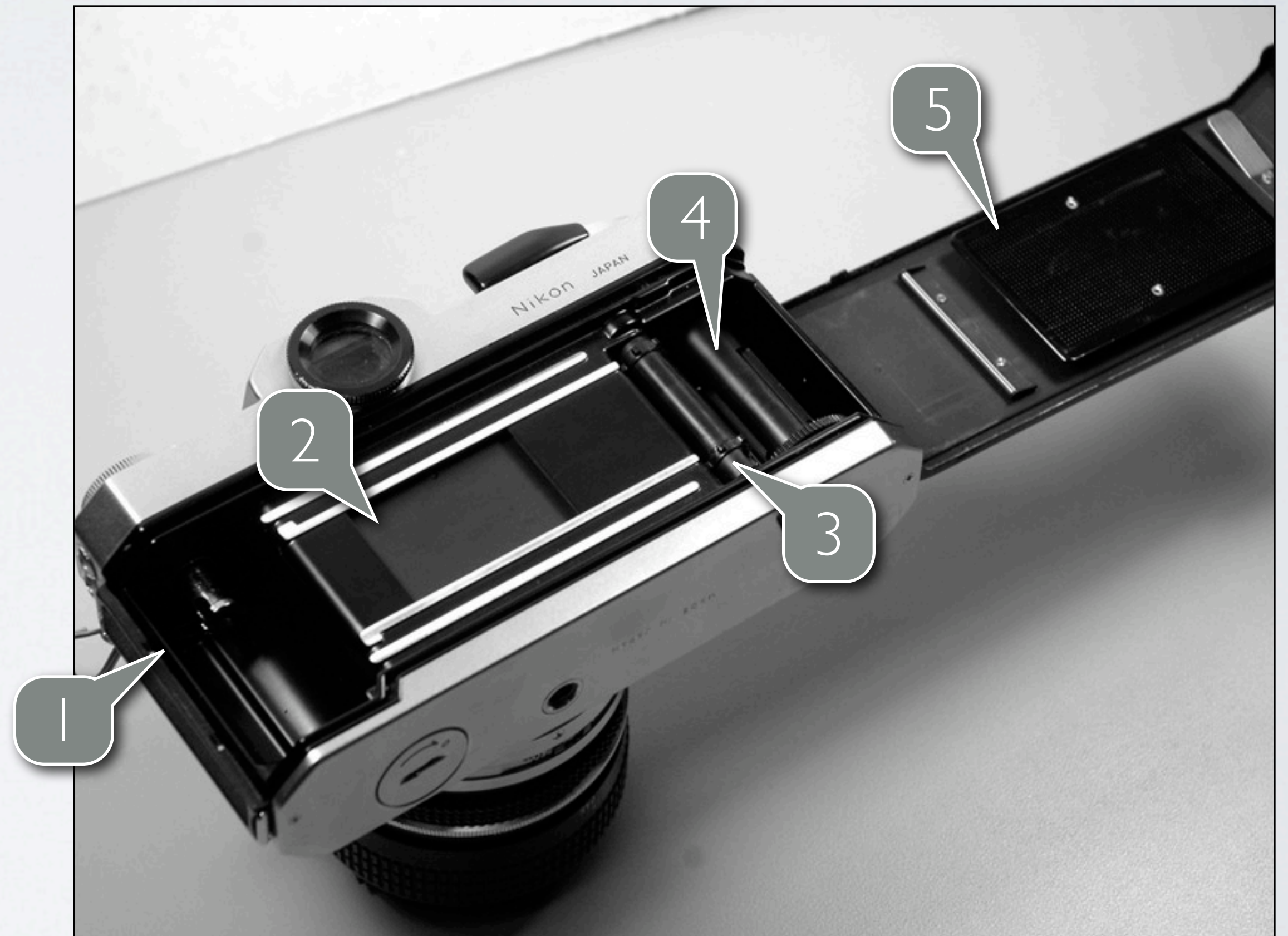
3. Tripod Socket

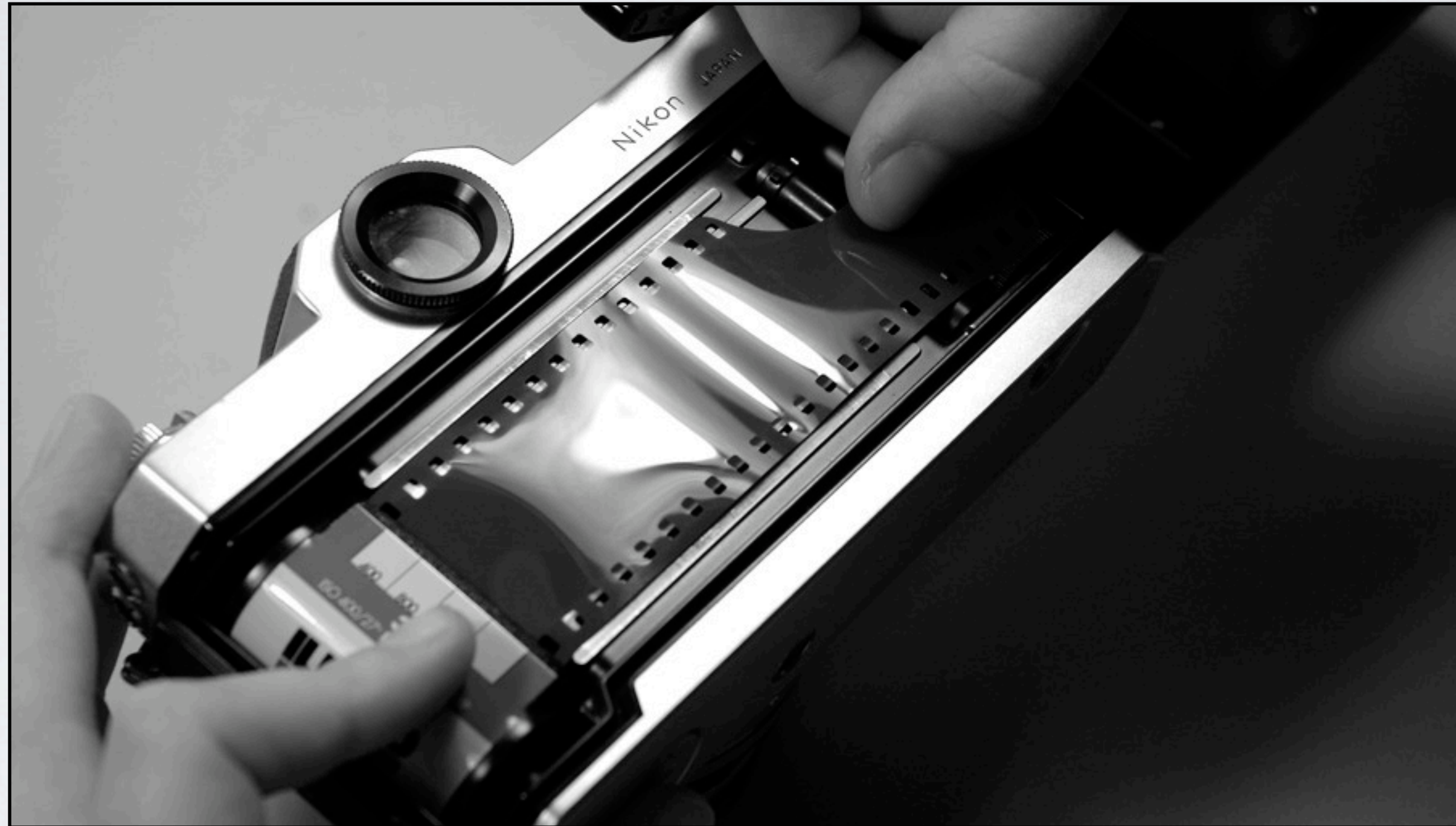
4. Film Rewind Release Button



# 35MM SLR CAMERA BACK INTERIOR

1. 35mm Film Cassette Chamber
2. Shutter Curtain
3. Sprocket Wheel
4. Take-up Spool
5. Film Pressure Plate





# LOADING FILM

foolproof method for loading film in the camera  
which guarantees film is advancing properly



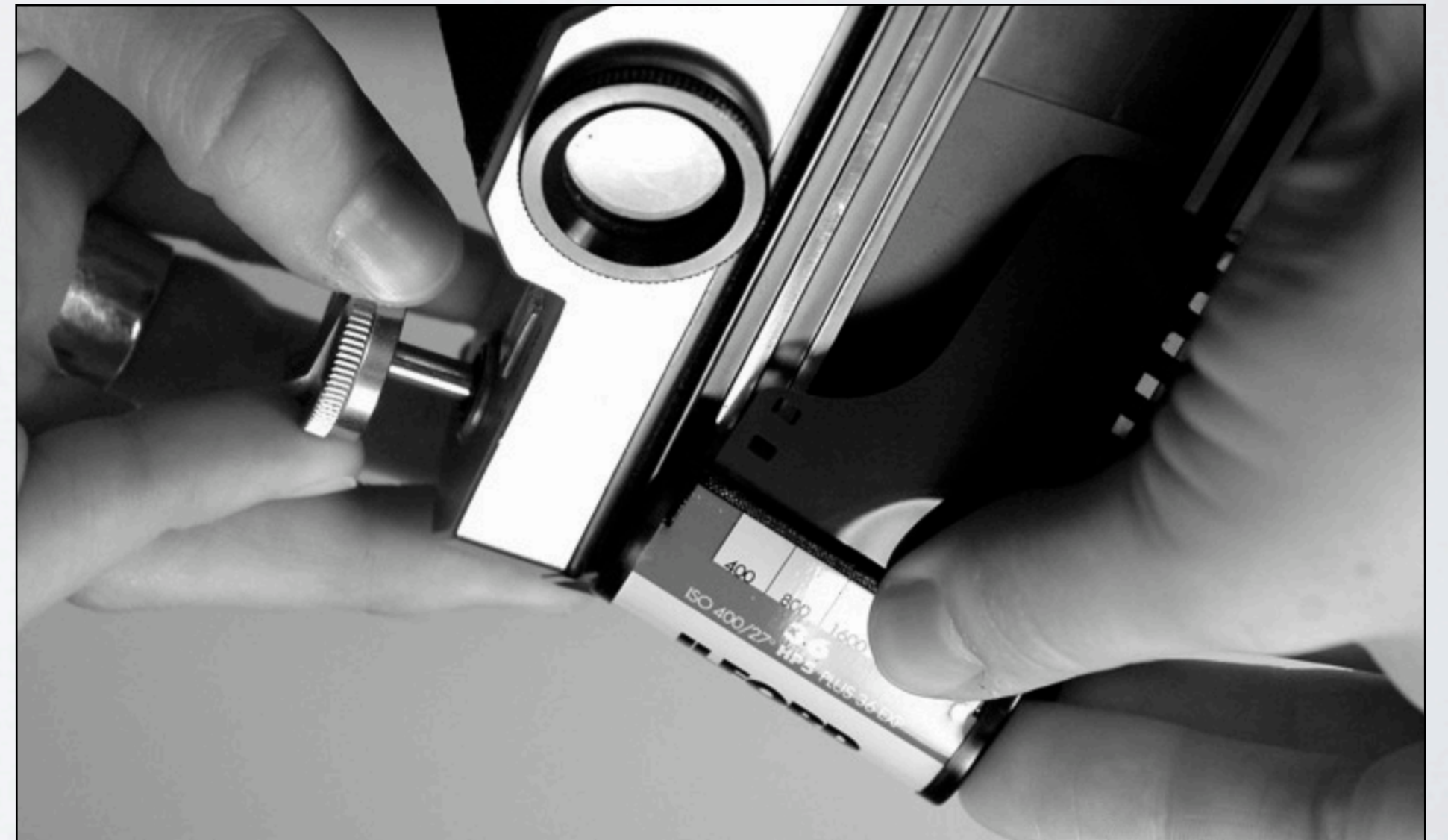
Film must be loaded and unloaded in subdued light.

Hold the camera firmly or place it on a sturdy surface and open the camera back. On most cameras this is accomplished by gently pulling up on the Film Rewind Crank until the back pops open.

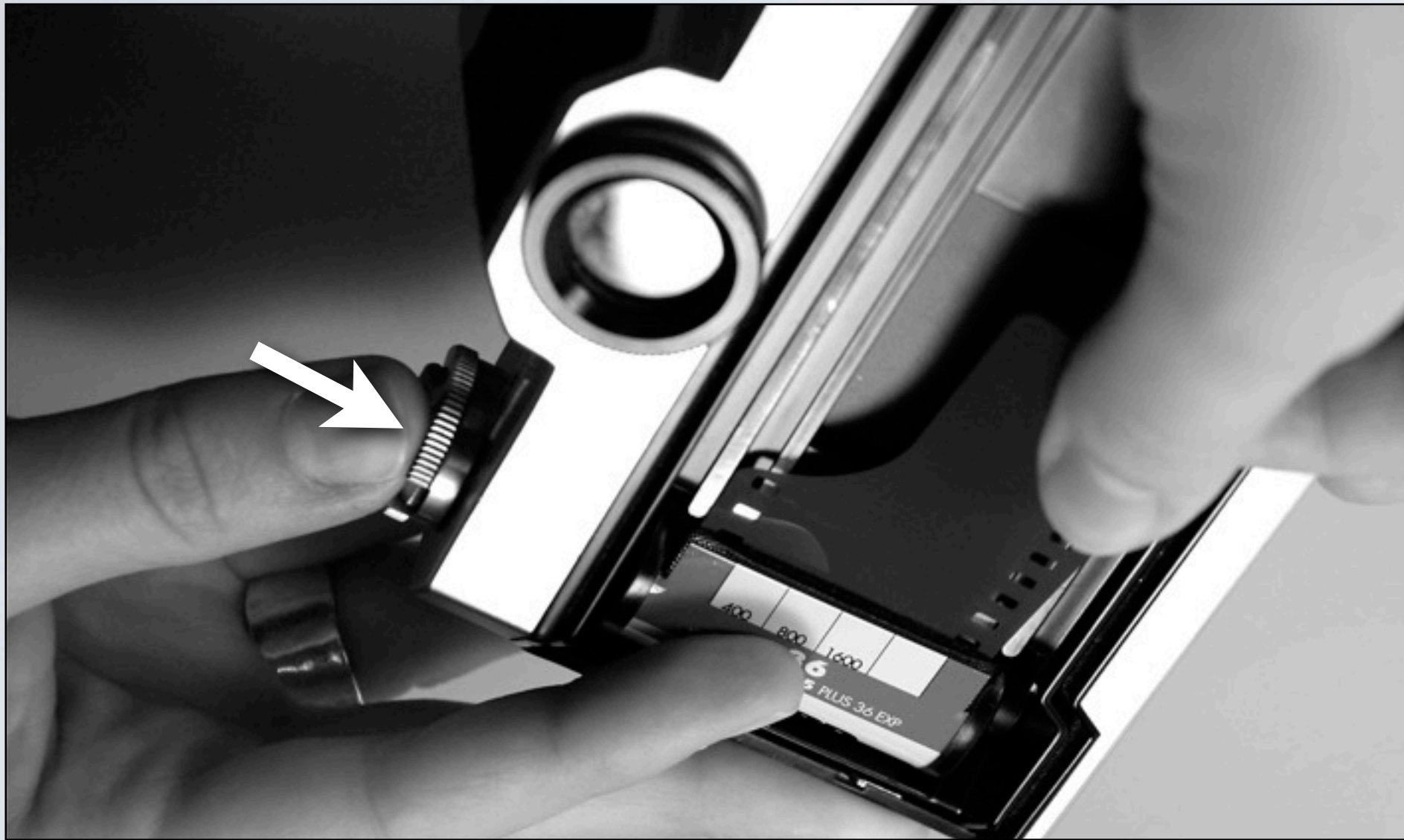
Hint: there may be a safety catch which prevents the Film Rewind Crank from pulling up. Consult your camera's manual.

With the Film Rewind Crank completely extended place the film cassette into the chamber with the film leader facing towards the Take-up Spool.

Hint: If the Film Rewind Crank is not fully extended it will block the film cassette.







Carefully lower the Film Rewind Crank to lock the cassette in place.

Hint: If the cassette is not properly seated the Film Rewind Crank will not be able to be lowered.

While pressing down on the film cassette with your left hand, grab the film leader and pull out just enough film to reach beyond the Sprocket Wheel to the Take-up Spool when the film is laying flat.



Place the end of the film leader into the slot on the Take-up Spool. You want to place just enough of the leader into the slot so that it will not slip back out. Too much and the film will bunch up. Too little and it will slip right back off. With a little practice this will become second nature.

NOTE: The Take-up spool rotates as the Film Advance Lever is cocked. It may be helpful to advance the spool a little to place the slot in an ideal position.



Once the film leader is secured in the slot of the Take-up Spool begin to slowly cock the Film Advance Lever until the film leader is pulled completely around the Take-up Spool.

If the Film Advance Lever stops moving this means you need to press the Shutter Release Button before you can continue to advance the film.



Close the back of the camera firmly.  
Listen for the click.

## **Taking up slack in the film cassette**

Flip out the small handle on the Film Rewind Crank being careful to not raise the entire crank, and gently turn the crank clockwise. As soon as the crank stops or becomes difficult to turn--STOP ! The purpose is to wind the film tightly around the spool in the film cassette, if you keep turning after it stops there is a danger of ripping the film or damaging the sprockets.

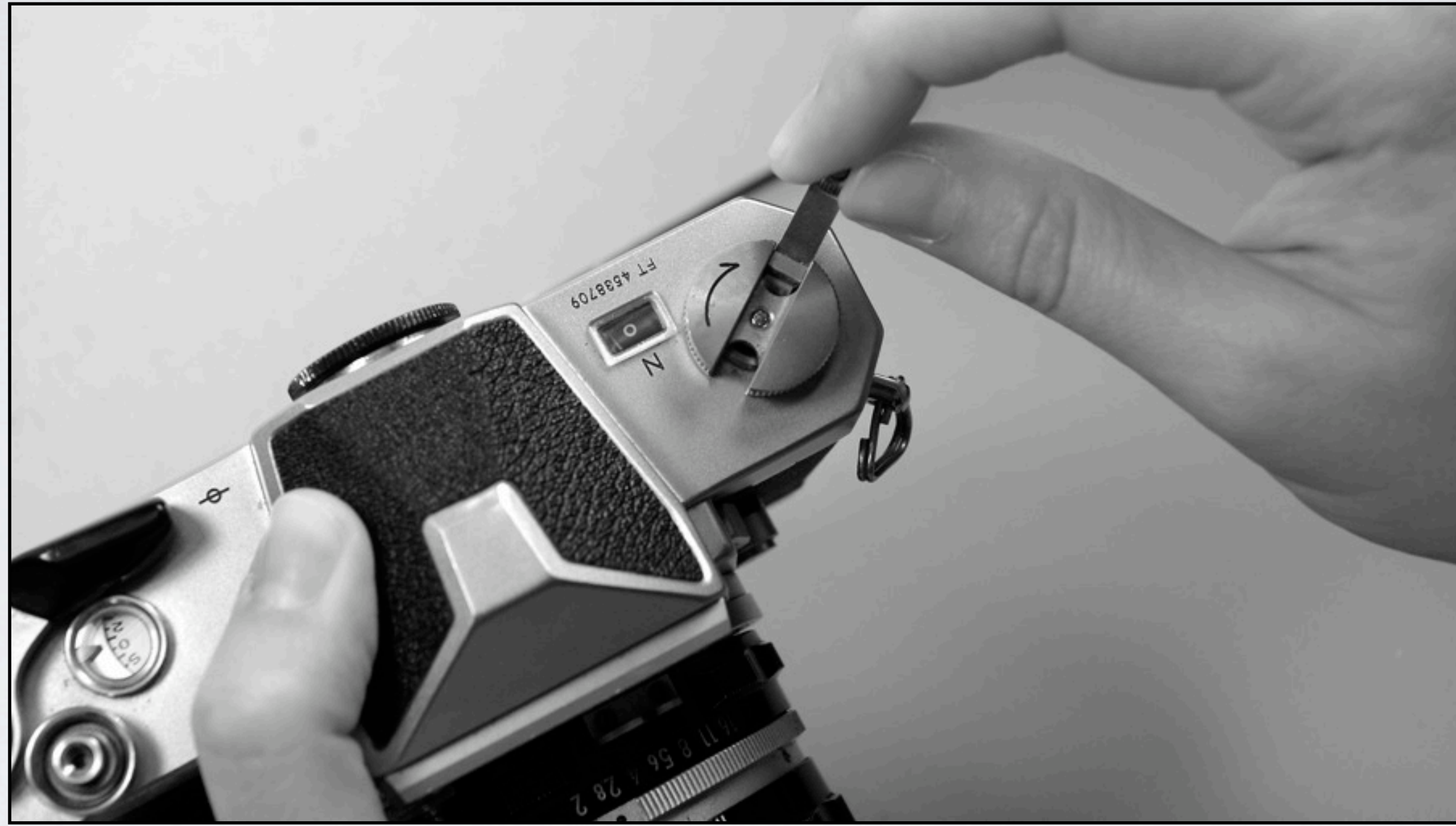


Now cock the Film Advance Lever. If you took all of the slack out of the film cassette in the previous step, then as you cock the Film Advance Lever the Film Rewind Crank rotates counterclockwise on its own. This is a guarantee that the film is installed properly.



Flip down the handle on the Film Rewind Crank and advance the film until the Film Counter indicates frame one. FINISHED !





# UNLOADING FILM

Rewinding and unloading a roll of film after it is completely exposed

# FINISHING A ROLL OF FILM

- A roll of 35mm film can fit approximately 36 exposures. You'll know you are at the end of the roll if the film will not advance when you attempt to cock the Film Advance Lever and the Film Counter is around 36.
- **WARNING:** At this point all of the film is out of the cassette and wound around the Take-up Spool. If you opened the back of the camera the entire roll would be exposed to light and ruined.



# I. RELEASE THE SPROCKET WHEEL

Before you can safely remove the film from the camera it must be rewound back into the film cassette.

To maintain tension on the film during normal shooting the Sprocket Wheel prevents the film from moving backward. Before you can rewind the film you must first press the Film Rewind Release Button to unlock the Sprocket Wheel.

Fully push in the release button before rewinding!



Some cameras have a release lever instead



Clockwise. Follow arrow.

## 2. REWIND THE FILM

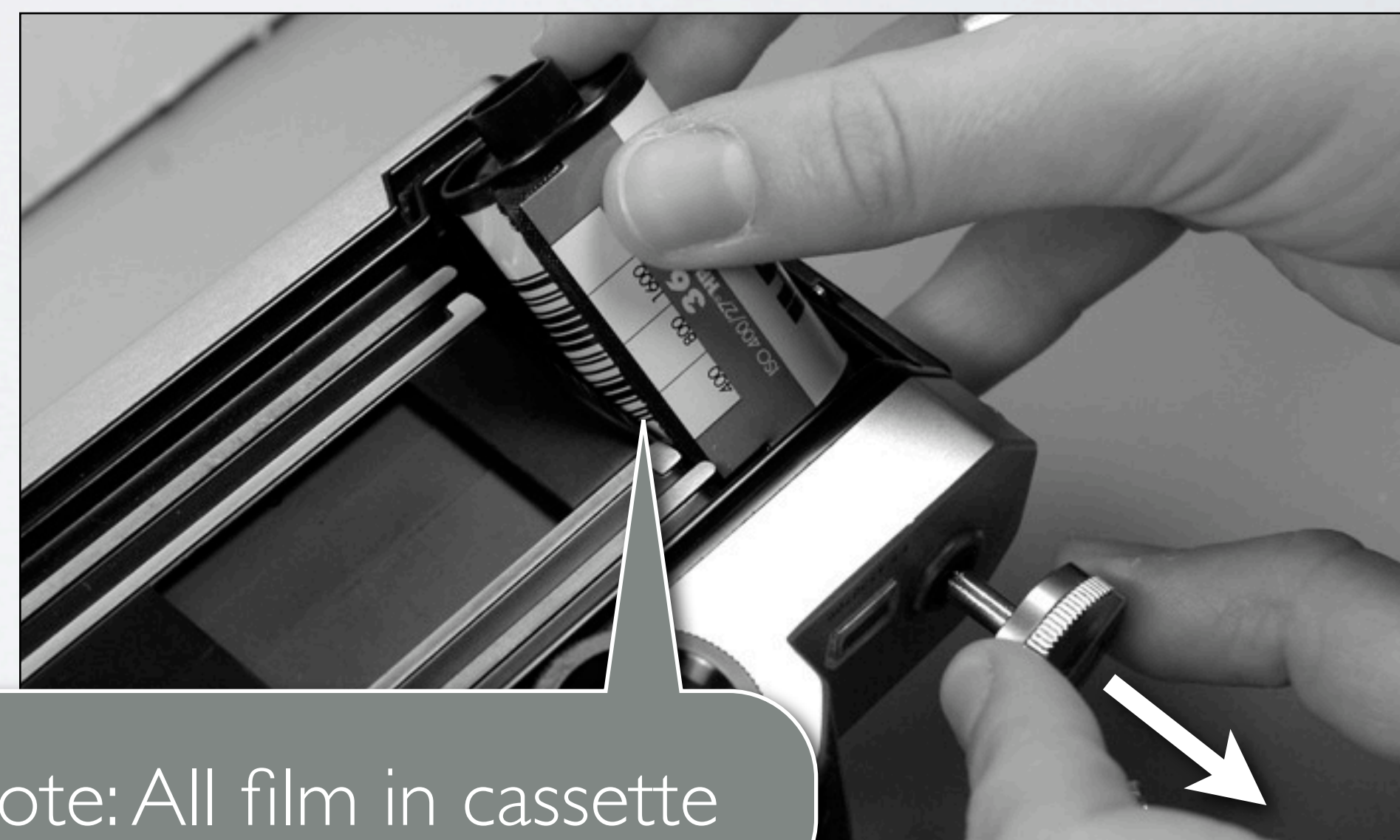
Flip up the handle on the Film Rewind Crank and begin to slowly turn clockwise (in the direction of the arrow). If the crank does not want to turn double check that the Film Release Button is still fully depressed.

**WARNING:** The film will rip and tear if you try and use force to rewind the film if the Sprocket Wheel is not released.

Continue to turn the crank until the film is wound all the way back into the cassette. You will feel a difference in the resistance when the film comes off the slot in the Take-up Spool. If in doubt, keep turning for a while (no harm in it).

## 3. OPEN THE CAMERA AND UNLOAD THE FILM

When you are confident that it is rewound, pull up on the Film Rewind Crank to open the back and remove the cassette. Remember to do this in subdued light.



Note: All film in cassette





# HOLDING THE CAMERA

Blurry images are often the result of camera shake which can be avoided by using a stabilizing grip

# HOLDING THE CAMERA STEADY

1. Grip side of camera with Right Hand
2. Place your index finger over the Shutter Release Button and your thumb on the Film Advance Lever
3. Cradle the bottom of the camera in the palm and fingers of your Left Hand
4. Use your left thumb to secure your grip on the side of the camera
5. Put both elbows against your rib cage and hold the camera against your forehead as you look through the viewfinder. The camera is stabilized.



# HOLDING & FOCUSING

While maintaining your Right Hand grip, slide your Left Hand thumb and index/middle fingers onto the focusing ring of the lens. Rotate ring to focus, then return Left Hand to initial position.

This should all be done in one fluid motion while continuing to look through the viewfinder.

Right Hand: release shutter, advance film, adjust shutter speed

Left Hand: adjust focus and f/stops



# KEEPING THE CAMERA STABLE

- Always employ stabilizing grip
- Plant your feet firmly and secure yourself before releasing the shutter
- Right before you release the shutter, exhale and hold your breath
- Gently press the Shutter Release Button. Quick jabs can jolt the camera.
- PRACTICE ! If it takes you 30 seconds to get into position, you'll miss a lot.



# EXPOSURE CONTROL

Adjusting Aperture and Shutter Speed

# EXPOSURE CONTROL

The photographer, after evaluating the illumination of the subject, must **set the exposure** on the camera. The camera has two adjustments that control how much light is allowed to expose the film: **Lens Aperture** and **Shutter Speed**.

Exposures are described as a combination of these two controls. The Aperture is measured in **f-stops** and the Shutter Speed in **fractions of a second**.

Photographing a subject on a Bright and Sunny day with 400ISO film loaded in the camera the photographer might choose **f/16 (Aperture)** at **1/125th (Shutter Speed)** of a second as an appropriate exposure.

First, we will discuss the Lens Aperture...

# APERTURE CONTROL

The lens aperture—used to control the *amount of light* which passes through to the film—is a diaphragm made of overlapping metal blades which can vary the diameter of the opening.

The size of the aperture is measured in f-stops. The f-stops on your lens are divided into regular intervals which denote exactly half (diameter gets smaller) or double (diameter gets larger) the amount of light between each f-stop. Changing from **f/4** to **f/5.6** is 1 stop less (half the) light and **f/5.6** to **f/4** is 1 stop more (double the) light.

An f-stop number describes the diameter as a fraction of the focal length of the lens. For example **f/4** on a 50mm lens indicates a diameter of 12.5mm (50/4). A larger f-stop number like **f/16** indicates a smaller aperture (and less light) than **f/4** since  $1/16 < 1/4$ . **f/4** on a 50mm lens passes the same amount of light as **f/4** on a 100mm lens. The f-stops are determined by multiplying or dividing by the  $\sqrt{2}$ :  
**f/1, f/1.4, f/2, f/2.8, f/4, f/5.6, f/8, f/11, f/16, f/22, f/32, f/45,...**



f/1.4



f/2



f/2.8



f/4



f/5.6



f/8



f/11



f/16

The aperture is measured in f-stops. Between each full f-stop the amount of light that passes through the lens is doubled or halved.

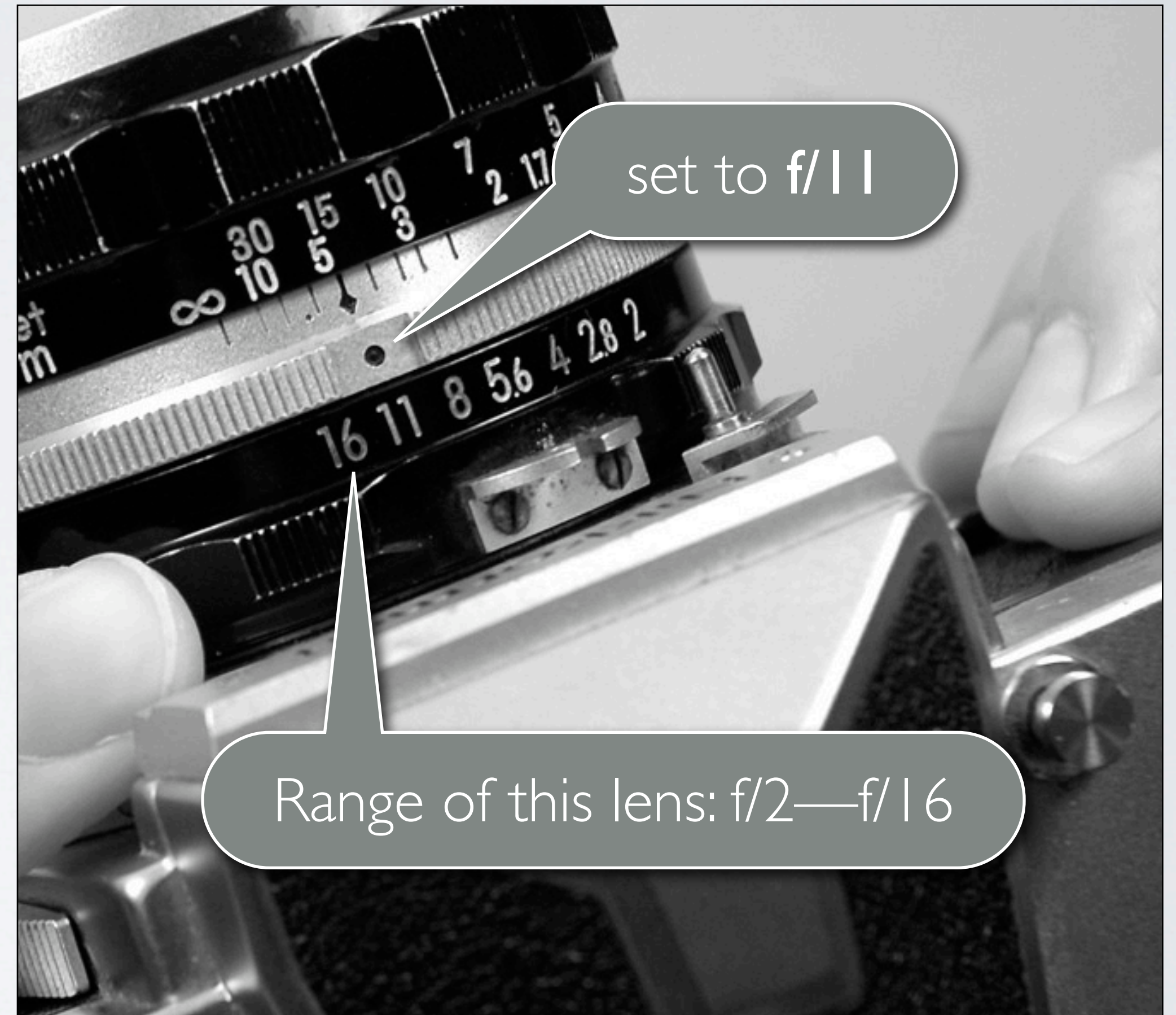


# APERTURE ADJUSTMENT

The f-stop is set by turning the barrel ring on the lens. The number that aligns with the center marker indicates the current f-stop.

The range of f-stops on each lens varies with the optical design. A typical 50mm SLR lens will open up to **f/1.4** or **f/2** and close down to **f/11** or **f/16** with a range of about 7 stops to choose from. More exotic lenses may offer an even wider range. Lens manufacturers describe the lens by the maximum aperture:

**50mm 1:2** will open up to **f/2**.

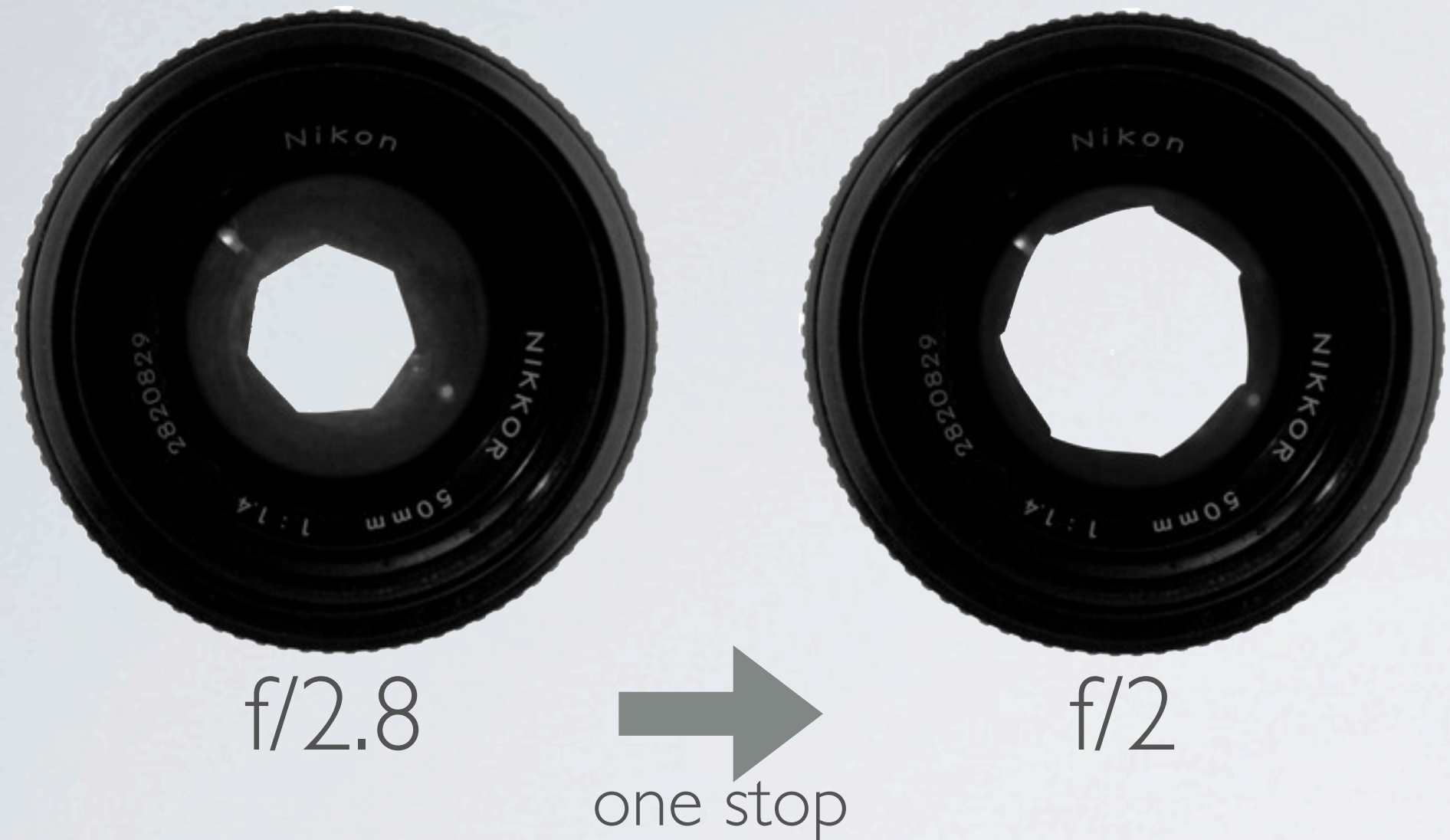




When you make the aperture smaller by one f-stop, like from **f/2** to **f/2.8** you have reduced the amount of light exactly in half. This is called **stopping down**, as in “stopped down from **f/2** to **f/2.8**” or “stopped down one stop”

If you continued from **f/2** past **f/2.8** to **f/4** you will have decreased the aperture by two stops and reduced the amount of a light by 1/4 (half and half again).





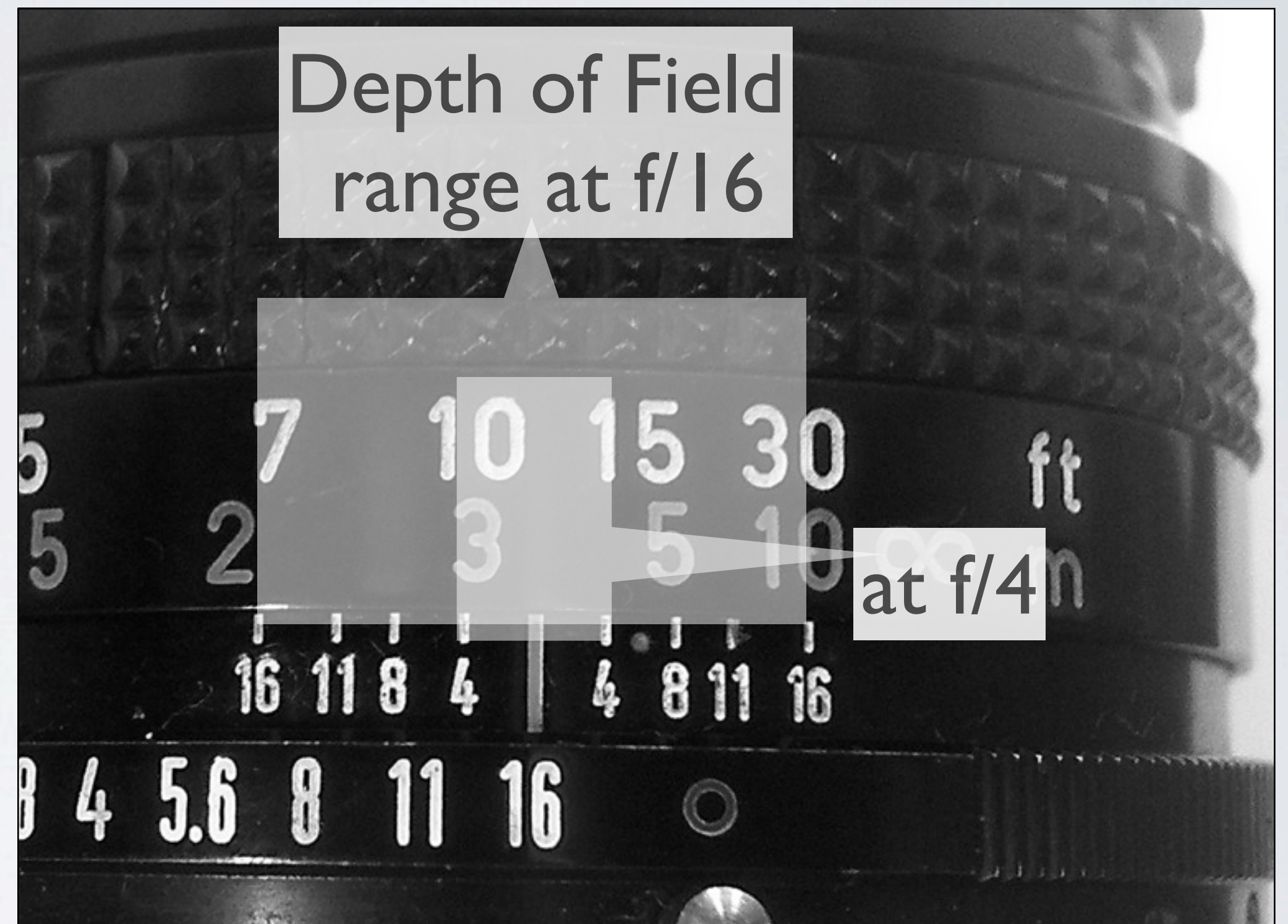
The opposite of stopping down is **opening up**, when you increase the size of the aperture. Changing from **f/2.8** to **f/2** is opening up by one stop and letting double the amount of light through the lens.

“I opened up 2 stops from **f/16** to **f/8** as a large dark cloud came overhead.”



# APERTURE & DEPTH OF FIELD

The size of the Aperture also controls the distance from the nearest point to the furthest point which will appear in focus. This distance is referred to as the Depth of Field. The smaller the Aperture the greater, or deeper, the Depth of Field (more in focus) the larger the Aperture the smaller, or shallower, the Depth of Field (less in focus). Use the scale on your lens to determine the depth. Observe the lens is focused around 12ft and the Aperture is set to  $f/16$ , everything from 7ft to 30ft will appear sharp, but at  $f/4$  the depth would be from 10ft to 14ft.



Depth of Field Scale on the Lens

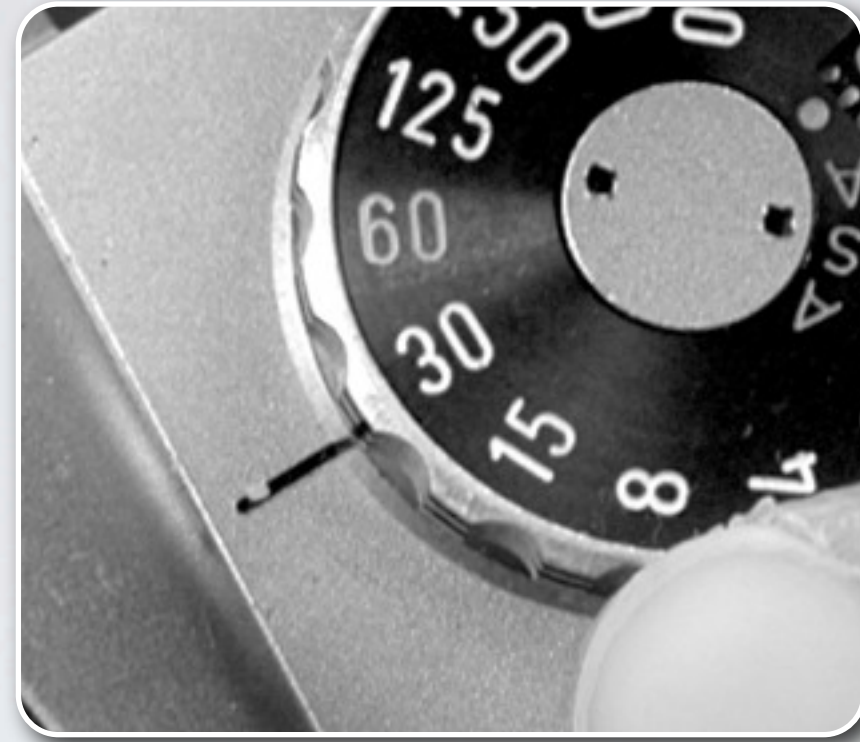


# SHUTTER CONTROL

The camera shutter—used to control *the duration of light* passing through to the film—is a curtain in the camera between the lens and the film. When the **Shutter Release** button is pressed the curtain opens for a preselected duration and the light strikes the film. The **Shutter Speed Selector** controls the duration that the curtain remains open.

The **Shutter Speed Selector** has settings starting at one second, indicated by **1**, and continuing in a fractions of a second: **2 (1/2 sec)**, **4 (1/4 sec)**, **8 (an eighth)**, **15 (a fifteenth)**, **30**, **60**, **125**, **250**, **500**, **1000**. Most cameras also include a **Bulb** or **B** setting which will keep the shutter open as long as the **Shutter Release** button is held down. Useful for long exposures greater than one second.

A **fast shutter speed** (like a 1/25th) lets in **less light**.  
A **slow shutter speed** (like a 1/5th) lets in **more light**.



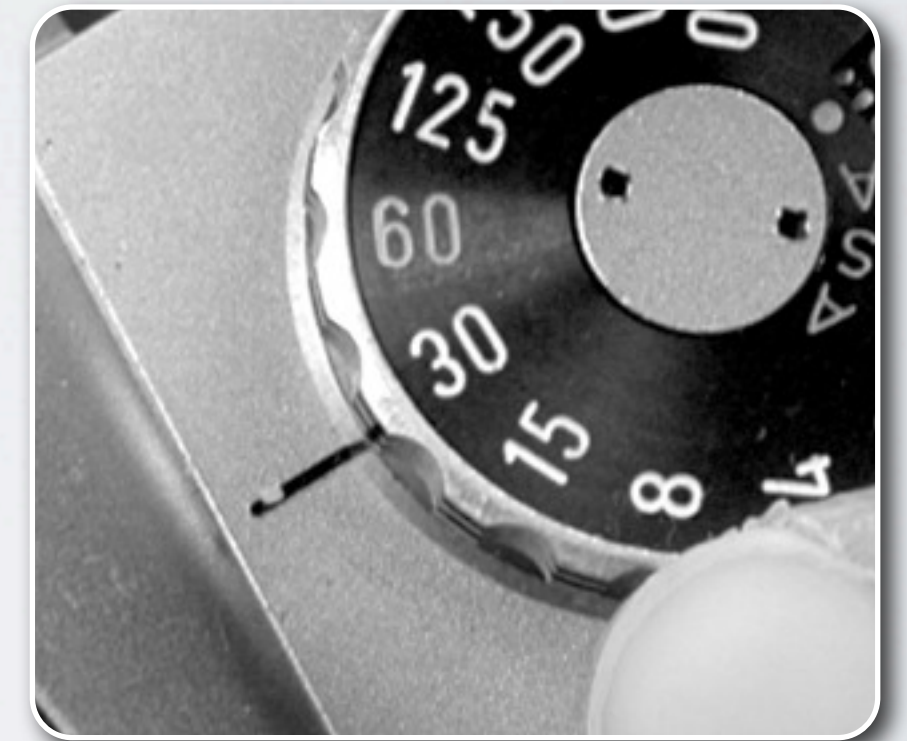
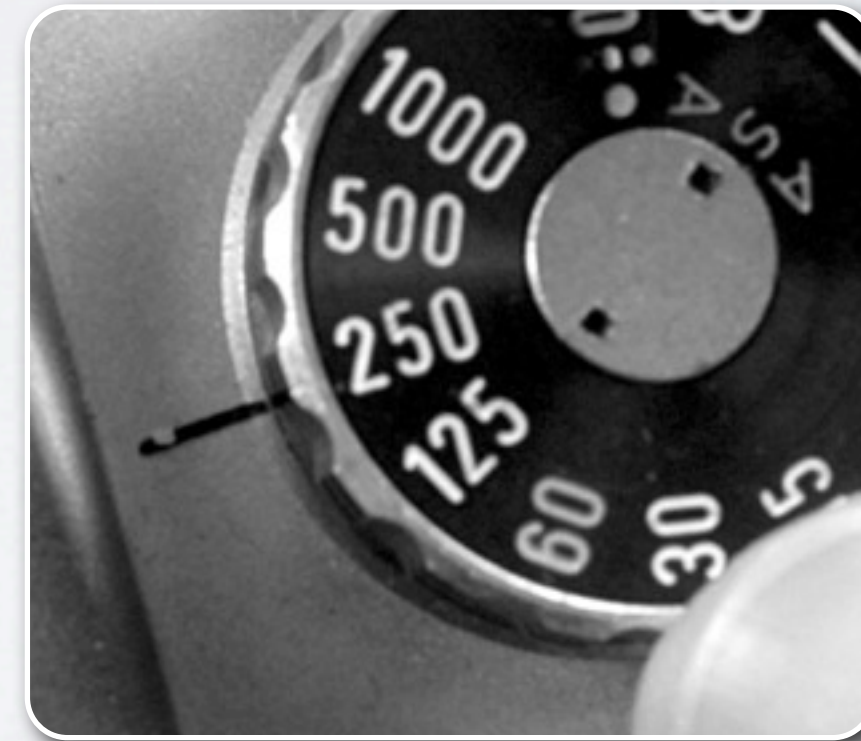
1/15th



1/30th

When you decrease the duration of the shutter by half, for example from **1/15th** to **1/30th**, you will have allowed half the amount of light in, or one stop less light.

As you increase the duration of the shutter, you double the amount of light between each setting. If you went from **1/250th** to **1/30th** you would increase the exposure by **3 stops: 1/250 to 1/125 to 1/60 to 1/30.**



1/250th



1/30th

# SHUTTER SPEED & MOTION

Shutter speeds **faster than 1/60th** of a second **freeze the motion** of a fast moving subject as well as **reducing blur due to camera movement** when the camera is hand held. The quicker the motion the faster the shutter speed required to have the subject appear sharp and frozen. However, faster shutter speeds require a larger lens aperture with a reduction in the depth of sharpness.

Shutter speeds of **1/30th and slower** produce **motion blur in moving subjects** (when desired) but most people will be **unable to hold the camera steady** at these speeds, making the use of a tripod or other support for the camera to keep it still. Slower speeds allow for a smaller lens aperture with increased depth of sharpness.

Subjects under **bright illumination** generally allow for fast shutter speeds and smaller lens apertures resulting in the greatest degree of sharpness. Subjects under **dim illumination** require slower shutter speeds and larger lens apertures with the greatest challenge to sharpness.

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more information coming soon...